USER'S GUIDE ADDENDUM

SMARTSTACK ELS100-24
FIRMWARE REVISION 2.01

9033194

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This addendum is to be used in conjunction with the Installation and User Guide that ships with the Cabletron SmartSTACK 100 ELS100-24TXG and/or ELS100-24TXM Ethernet Switches.

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ADDENDUM A. SMARTSTACK ELS100-24 FIRMWARE REVISION 2.01

A.1 Introduction

The Cabletron SmartSTACK ELS100-24 firmware revision 2.01 supports the following models of the ELS100-24 product family:

- ELS100-24TX
- ELS100-24TXM
- ELS100-24TXG

Firmware revision 2.01 provides the following new features:

- SmartTrunking - Allows multiple physical ports of the switch to be aggregated together to form a single logical connection between network devices.
- Half-duplex support on 100Base-FX ports - Enables half duplex operation on 100Base-FX ports.
- Read-only password - Adds an additional password option to the user interface (serial console and Telnet) for read-only access.
- Disable serial console option - Adds a variable to SNMP allowing the serial console of the switch to be disabled or enabled.
- Syslog feature - Allows various types of errors encountered by the switch software to be logged to an external server.
- MIB Enhancements
  - 802.1p and 802.1Q MIB: Adds partial support for the IETF MIBs for configuring 802.1p (priority) and 802.1Q (VLANs).
  - RFC 2233 MIB: Adds support for the Stack Table portion of RFC 2233, extensions to the Interfaces MIB.
  - Cabletron MIB Extensions: Adds several new variables to the Cabletron MIB.
  - SmartTrunking MIB: Adds a new proprietary MIB for configuring SmartTrunking.

The following two features were available in the previous Cabletron SmartSTACK ELS100-24 firmware version, but were not documented:

- Power Up Diagnostics - Allows you to enable a switch functionality self-test upon initialization.
- Web Management Enable - Allows you to enable switch management over the web.

A.2 User Interface Menu Hierarchy

Figure A-1 shows the user interface hierarchy for the Cabletron SmartSTACK ELS100-24, firmware revision 2.01.

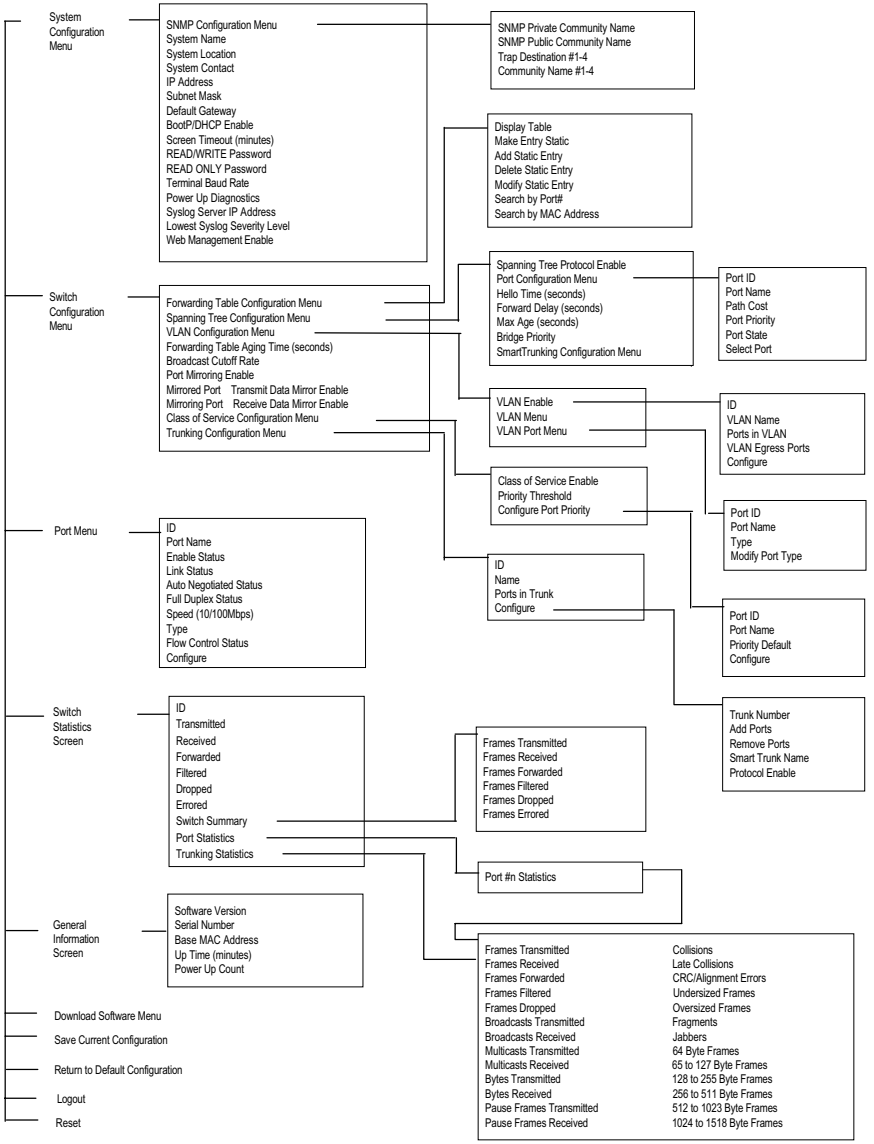

Figure A-1. User Interface Menu Hierarchy

A.3 SmartTrunking

SmartTrunking is a link aggregation feature that allows multiple physical ports of the switch to be aggregated together to form a single logical connection between network devices. All physical connections in the logical connection carry traffic, as compared with previous software versions in which Spanning Tree would block all traffic on all but one of the physical connections.

Background

A trunk is a group of ports that perform as a single logical port, connecting the ELS100-24 switch with another network device. Compared with a single port, the group of ports in a trunk feature increased bandwidth and provide a level of connection resiliency - when one physical port link in the trunk group goes down, the overall connection is not lost. When a port in a trunk group is removed (link goes down or a cable is severed), traffic on that port will be redistributed to other ports in the trunk group.

In the example in Figure A-2 below, three switches are connected (stacked) through a series of trunk groups. Two physical ports are combined to form each trunk group. The fiber ports in the top switch form Trunk 1 which carries traffic to the network backbone.

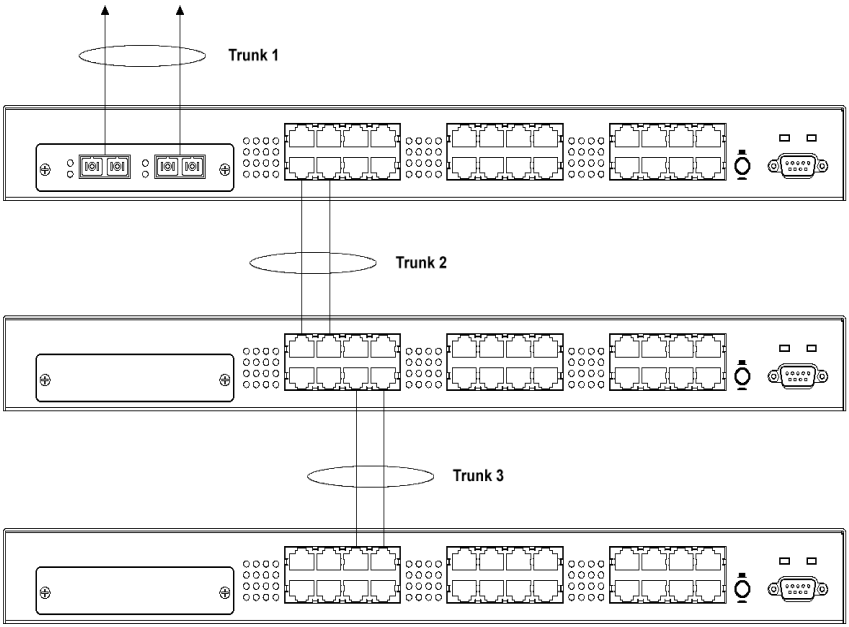

Figure A-2. Trunking Application Example

SmartTrunking uses the DEC Hunt Group protocols - PLAP and LLAP - to automatically establish and maintain a trunk connection. Use of these protocols can be enabled or disabled as desired. When the protocols are

enabled, the switch is SmartTrunk-compliant and will automatically configure to work with Cabletron products such as a Smart Switch Router (SSR), SmartSwitch, SmartSTACK, etc. When the protocols are disabled, the switch can be manually configured to interoperate with trunking implementations used by other vendors.

SmartTrunking support in firmware revision 2.01 follows these configuration rules:

- There can be up to 2 trunk groups configured per switch cluster (group of 8 ports).
- Individual trunk groups can be defined only in one cluster, not across clusters.
- There can be from 2-8 ports defined per trunk group.
- There can be up to 6 trunk groups defined per switch.
- Ports in a trunk group can operate in any combination of speed and duplex mode (10 half with 100 full, for example).
- Ports in a trunk group must be in the same VLAN and have the same VLAN mode (hybrid/access).
- The Gigabit Ethernet ports on the ELS100-24TXG cannot be trunked.

Further information on SmartTrunking can be found in the *Cabletron Systems SmartTrunk User's Guide*. To examine this guide, see the Cabletron Systems user manual website at:

http://www.cabletron.com/support/manuals

The implementation of SmartTrunking in firmware version 2.01 on the ELS100-24 product line differs in several ways from the information contained in the SmartTrunk User's Guide. The primary differences in the ELS100-24 implementation are as follows:

- Full load balancing of traffic across ports in a trunk is not supported. Unicast traffic is sent to the same port that the destination MAC address of the packet was learned.
- Although it is highly recommended, Spanning Tree does not have to be enabled to use SmartTrunking.
- The ports in a trunk are not required to operate in full duplex mode, but can be operated in any combination of half duplex or full duplex.
- If a port in a trunk goes down, traffic on that port is redirected onto other links in the trunk whether protocols are enabled or disabled.
- If protocols are disabled, inadvertently configuring a user-attached port to a SmartTrunking trunk group will not result in the user losing network connectivity.
- The concept of logical ports, each comprised of the physical ports in a trunk group, is not implemented. In both the User Interface and SNMP, both physical port and trunk numbers can be accessed. However, port-related configuration features, such as port mirroring, VLANs, Class of Service, and Spanning Tree, are performed only on a physical port basis, not a logical port (trunk) basis.

A.3.1 Configuring SmartTrunking: User Interface

SmartTrunking can be configured through the user interface.

Ports that are members of a trunk group are indicated as such by an asterisk ' * ' next to the port number on the Port Menu of the user interface.

A.3.1.1 SmartTrunking Configuration Menu

To configure Trunking, do the following:

1. Select Switch Configuration Menu from the Main Menu.
2. Select Trunking Configuration Menu. Figure A-3 shows the Trunking Configuration menu.

```
TRUNKING CONFIGURATION                    Access Control: READ/WRITE

Trunking Enabled                  Yes
Trunking Protocol                 Yes

ID          NAME                  PORTS IN TRUNK
-------------------------------------------------------------------------------

d. Protocol Enable    e. Enable     x. Previous Menu

Enter Selection:
```

Figure A-3. Trunking Configuration Menu

Table A-1 describes fields and options available in the Trunking Configuration menu.

Table A-1. Trunking Configuration Menu Description

Fields/Options	Description
Trunking Enabled	Indicates whether trunking is enabled (Yes) or disabled (No).
Trunking Protocol	Indicates whether trunking protocols are enabled (Yes) or disabled (No).
ID	Lists the trunk group ID number.
Name	Lists the trunk group name (1-14 characters).
Ports inTrunk	Lists the ports in the trunk group.
Configure	Option that allows you to create a new, or configure an existing, trunk group.
Delete	Option that allows you to delete an existing trunk group.

3. Select **c** from the Trunking Configuration menu to configure trunking. The following message appears:

   Enter Trunk Number (1-6):

4. Enter a trunk group number. In this example, enter the number **1**. Press [Enter].

Figure A-4 shows the Trunk Configuration menu with trunk group number 1.

```
TRUNK 1 CONFIGURATION                    Access Control: READ/WRITE

Name
Trunk Status                    CONNECTED
Trunking Protocol               No

PORT        ENABLED        LINK STATUS
-------------------------------------------------------------------------------

a. Add Port(s)          b. Remove Port(s)       c. Trunk Name
d. Protocol Enable      x. Previous Menu

c. Configure            d. Delete               x. Previous Menu

Enter Selection:
```

Figure A-4. Trunk Configuration Menu

Table A-2 describes the Trunk Configuration menu.

Table A-2. Trunking Configuration Menu Description

Field	Description
Name	Lists the trunk group name. Use the Trunk Name option to create a trunk group name (1-14 characters).
Trunk Status	Lists the trunk group status: PARTIAL (one or more of the trunk group ports are linked and one or more are not linked), CONNECTED (all ports in the trunk group are linked), DISCONNECTED (no ports in the trunk are linked).
Trunking Protocol	Indicates whether trunking protocols are enabled (Yes) or disabled (No).
Port	Identifies the port by number.
Enabled	Indicates whether the port is enabled (Yes) or disabled (No).
Link Status	Indicates port link status: connected or disconnected.
Selection	**Description**
Add Port(s)	Allows you to add port(s) to the trunk.
Remove Port(s)	Allows you to remove port(s) from the trunk.
Trunk Name	Allows you to create a unique trunk group name (1-14 characters).
Protocol Enable	Allows you to enable (Yes) or disable (No) the operation of the trunking protocols on this trunk.

5. Select **a** to add ports. The following message appears:

   Enter Port Number(s) or Range of Port(s) 1-26:

6. In this example, a range of ports is entered to form a trunk group. Enter **1-4** and press [Enter]. Figure A-5 shows the update to the screen.

```
TRUNK 1 CONFIGURATION                    Access Control: READ/WRITE

Name
Trunk Status                             CONNECTED
Trunking Protocol                        No

PORT    ENABLED          LINK STATUS
-------------------------------------------------------------------------------
 1          Yes          CONNECTED
 2          Yes          CONNECTED
 3          Yes          CONNECTED
 4          Yes          CONNECTED

a. Add Port(s)        b. Remove Port(s)      c. Trunk Name
d. Protocol Enable    x. Previous Menu

Enter Selection:
```

Figure A-5. Adding a Range of Ports to a Trunk

7. To add a trunk name, enter **c**. The following message appears:

   Enter Trunk Name:

8. Enter a trunk name. In this example, enter **Backbone** and press [Enter]. This new name appears in the Name field.

9. Enter **x** to return to the previous menu. Figure A-6 shows the ports that have been configured in trunk group 1.

```
TRUNKING CONFIGURATION                   Access Control: READ/WRITE

Trunking Protocol                        No

ID          NAME          PORTS IN TRUNK
-------------------------------------------------------------------------------
1           Backbone      1-4

c. Configure      d. Delete      e. Enable      x. Previous Menu

Enter Selection:
```

Figure A-6. Ports Configured in a Trunk Group

10. To view Trunking Statistics, return to the Main Menu, and select Switch Statistics, then Trunking Statistics. When displaying statistics for a trunk group, the statistics are the sum of the statistics for all physical ports in the trunk group.

When configuring trunk groups, consider the following:

- When adding or removing port(s), the following message appears:

  Enter Port Number(s) or Range of Port(s)

  You can enter individual ports, separated by a comma, or a range of ports separated by a hyphen.

- Protocol Enable either enables or disables a proprietary Cabletron protocol to be run by the switch for purposes of automatically establishing and maintaining a trunk.

  If the protocol is enabled, the switch uses the proprietary DEC Hunt Group protocol to detect when multiple links are established between two devices, and then automatically set up a trunk. Normally, Spanning Tree would detect multiple links, and block all but one. However, with trunking, multiple paths are valid. Protocols should be enabled when connecting the SmartSTACK switch to other Cabletron devices, or any other devices using the DEC Hunt Group protocol.

  If the protocol is disabled, trunks should be manually configured using the user interface, SNMP, or web access.

A.3.1.2 Spanning Tree Trunk Configuration Menu

Trunking operation relative to Spanning Tree can be viewed through the user interface. To view trunking configuration for Spanning Tree, do the following:

1. Select Switch Configuration Menu from the Main Menu.
2. Select Spanning Tree Configuration Menu.
3. Select Trunking Configuration Menu.

   Figure A-7 shows an example of the Spanning Tree Trunk Configuration menu.

```
SPANNING TREE TRUNK CONFIGURATION      Access Control: READ/WRITE

TRUNK ID    TRUNK NAME    PATH COST    PORT PRIORITY    PORT STATE
-------------------------------------------------------------------------------------------------------------
   2          Server3          2              0          DISABLED
   3          Backbone         2              0          DISABLED

r. Refresh        x. Previous Menu

Enter Selection:
```

Figure A-7. Spanning Tree Trunk Configuration Menu

Table A-3 describes fields and options available in the Spanning Tree Trunk Configuration menu.

Table A-3. Spanning Tree Trunk Configuration Menu Description

Field/Option	Description
Trunk ID	Lists the trunk group ID.
Trunk Name	Lists the trunk group name.
Path Cost	The contribution of the path through this port when it is the root port to the total path cost from this bridge to the root bridge: 10 for 100 Mbps ports, 100 for 10 Mbps ports.
Port Priority	The relative priority of the port on the bridge.
Port State	The current Spanning Tree state of the port on the bridge, either: disabled, listening, learning, forwarding, or blocking.
Refresh	Refreshes the screen to reflect latest system conditions.

A.3.2 Configuring SmartTrunking: Web-Based Management

SmartTrunking can be configured through a web browser-based utility which allows you to configure and manage Cabletron SmartSTACK ELS100-24 switches remotely. For more information, see the *Cabletron WebView, Web-Based Management for the ELS100-24 User Guide.* To examine this guide, see the Cabletron Systems user manual website at:

http://www.cabletron.com/support/manuals

A.3.2.1 SmartTrunking Configuration

To configure SmartTrunking, do the following:

1. Select the Switch Configuration link from the Main Menu of Cabletron Webview.
2. Select Trunking Configuration menu. Figure A-8 shows the Trunking Configuration menu.

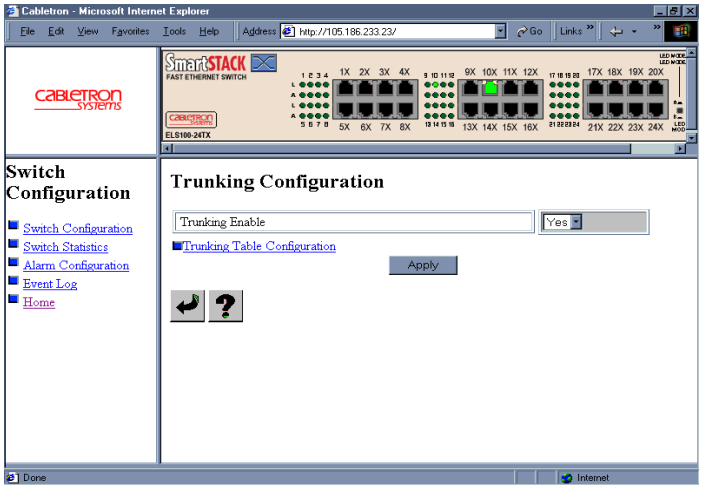

Figure A-8. Trunking Configuration Menu

3. To enable SmartTrunking on the switch, select "Yes" from the Trunking Enable drop-down menu, then select Apply.

4. Select Trunking Table Configuration. Figure A-9 shows the Trunking Table Configuration menu.

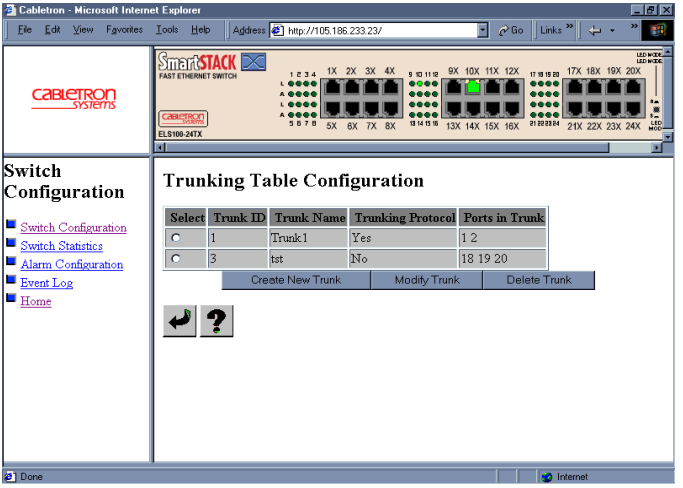

Figure A-9. Trunking Table Configuration Menu

5. To create a new trunk group, select Create New Trunk. Figure A-10 shows the Create New Trunk menu.

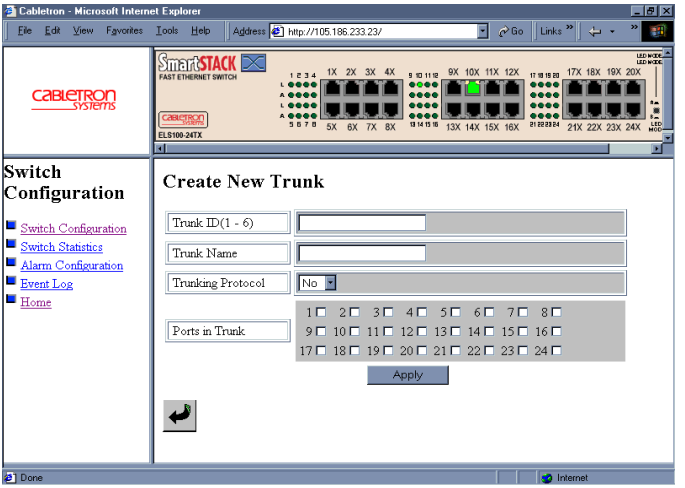

Figure A-10. Create New Trunk Menu

6. Enter the Trunk ID, the Trunk Name, the Trunking Protocol status, and the ports in the trunk, then select Apply.

7. To modify an existing trunk group, first choose the trunk to modify by selecting the radio button next to the appropriate trunk on the Trunking Table Configuration menu (Figure A-9). Then select Modify Trunk. Figure A-11 shows the Modify Trunk menu.

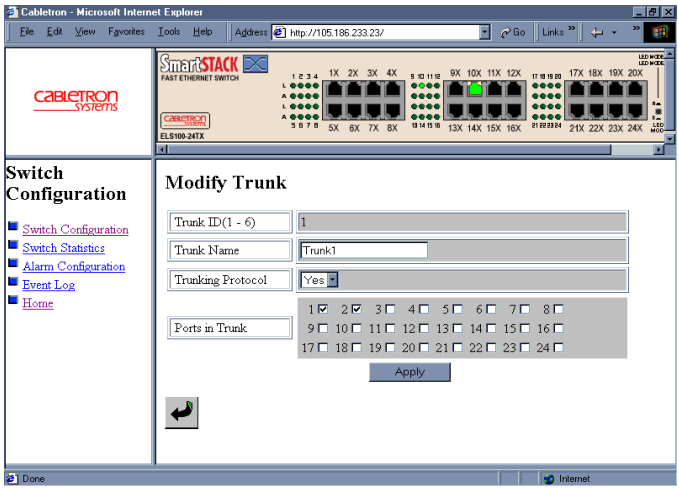

Figure A-11. Modify Trunk Menu

A.4 Half Duplex Support on 100Base-FX Ports

Half duplex support on 100Base-FX ports of the ELS100-24TXM has been added in firmware revision 2.01. Previously, only full duplex operation was supported on 100Base-FX ports. Figure A-12 shows the Port Configuration menu and the Full Duplex option.

Half Duplex operation is enabled when you set Full Duplex to No.

```
PORT 1 CONFIGURATION                    Access Control: READ/WRITE

  a. Port Name                  Val d'Or
  b. Port Enable                Yes
  c. Flow Control Enable        Yes
  d. Full Duplex                No
  e. Port Speed                 100

  x. Previous Menu

Enter Selection:
```

Figure A-12. Port Configuration Menu

A.5 Read-only Password Protection

Read-only password protection has been added in firmware revision 2.01. This feature adds an additional password option to the user interface (for serial console and Telnet) for read-only access. Previously only read/write password protection was available. To configure read-only password protection, do the following:

1. Select System Configuration Menu from the Main Menu (Figure A-13).

```
SYSTEM CONFIGURATION                    Access Control: READ/WRITE

  a. SNMP Configuration Menu
  b.  System Name
  c. System Location
  d. System Contact
  e. IP Address                         000.000.000.000
  f. Subnet Mask                        000.000.000.000
  g. Default Gateway                    000.000.000.000
  h. BootP/DHCP Enable                  Yes
  i. Screen Timeout (minutes)           0
  j. READ/WRITE Password
  k. READ ONLY Password
  l. Terminal Baud Rate                 9600
  m. Power Up Diagnostics               Yes
  n. Syslog Server IP Address           000.000.000.000
  o. Lowest Syslog Severity Level       warning
  p. Web Management Enable              Yes

  x. Previous Menu

Enter Selection:
```

Figure A-13. System Configuration Menu

2. Select READ ONLY Password. The following message appears:

Enter New Password:

3. Enter a password containing six to eight alphanumeric characters and press [Enter]. The following message appears:

Re-enter New Password:

4. Enter the password again and press [Enter] to confirm. If the password is re-entered correctly, the following message appears:

Password Changed

Press any Key to Continue

Refer to the Installation and User Guide, Chapter 3, "*Setting Password Protection*" for more information.

A.6 Disable Serial Console

A new MIB variable was added to the Cabletron proprietary MIB allowing the serial console of the switch to be disabled or enabled via SNMP. Previously, the serial console was always enabled. The name of the variable is SysComPortEnable as shown in the table in A.8.3 Cabletron Proprietary MIB below.

Make sure the switch IP address is recorded in an easy to locate place. If the serial console is disabled, and the IP address of the switch is forgotten, the switch cannot be managed.

A.7 Syslog

The syslog capability was added to firmware revision 2.01, enabling the switch to forward information about errors and other conditions encountered by the software. If the switch encounters an operational error, it can be configured to log this occurrence to an external syslog (UNIX) server.

The web interface can be also be used to configure syslog.

A.7.1 User Interface

The IP address of the external syslog server is configured using the Syslog Server IP Address option in the System Configuration menu. The lowest severity condition to report is configured using the Lowest Syslog Severity Level option in the same menu.

To configure syslog, do the following:

1. Select System Configuration menu from the Main Menu.
2. Select Syslog Server IP Address. The following message appears:

   Enter Syslog Server IP Address:
3. In this example, the IP address of 24.1.133.111 is used. Enter the IP address and press [Enter]. The forwarding address now appears in the Syslog Server IP Address field (Figure A-14).

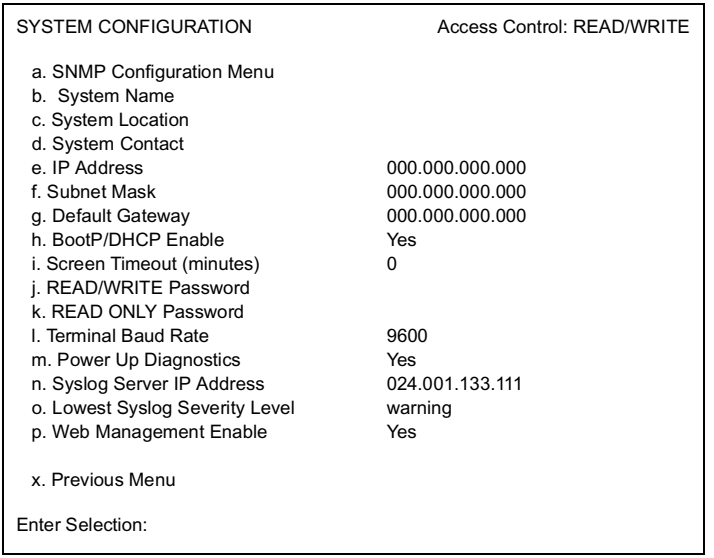

Figure A-14. Syslog Server IP Address

4. Select Lowest Syslog Severity Level. Eight different severity level options are available by selecting **o** until the desired setting appears.

Table A-4 describes each of these severity levels and conditions. The higher the severity, the lower the number.

Table A-4. Syslog Severity Level Descriptions

Severity Level	Condition
emergency (0)	System is unusable.
alert (1)	Action must be taken immediately.
critical (2)	Action must be taken immediately.
error (3)	Displays an error message.
warning (4)	Action must be taken to prevent performance degradation.
notice (5)	Normal condition. Signification of a potential error condition.
info (6)	Informational. No action required.
debug (7)	Displays a debug-level message.

A.8 MIB Enhancements

The following subsections describe MIB enhancements that have been provided in firmware revision 2.01.

A.8.1 802.1p and 802.1Q MIB

Support for portions of the IETF 802.1p (priority) and 802.1Q (VLANs) MIBs has been added.

- IEEE 802.1p MIB - The IEEE 802.1p MIB is an extension to the Bridge MIB defined by RFC 1493. This extension is used to manage priority and multicast filtering as defined by IEEE 802.1D-1998. The ELS100-24 switch supports only the portion of this MIB that is used to manage traffic classification and priority configuration.
- IEEE 802.1Q MIB - The IEEE 802.1Q MIB is an extension to the Bridge MIB defined by RFC 1493. This extension is used to manage 802.1Q tagged VLANs as defined by IEEE 802.1Q-1998. The ELS100-24 supports only the portion of this MIB that is relevant to its capabilities.

A.8.2 Interfaces MIB: RFC 2233

RFC 2233 defines extensions to the Interfaces group of MIB-II. The 2.01 firmware revision for the ELS100-24 switch adds support for only a portion of these extensions, specifically the Stack Table. This table is used to map the physical ports of a switch with the logical trunk group to which they belong.

A.8.3 Cabletron Proprietary MIB

Three new MIB objects were added to the Cabletron Proprietary MIB in firmware revision 2.01. The following is a description of these variables presented as a supplement to Table 5-1 in the Installation and User Guide.

Variable	Description
SysSyslogServer	The IP address of the Syslog server.
SysLowestSyslogSeverity	The least severe Syslog severity level sent to the Syslog server. All the logs with the same or higher severity will be delivered. The greater the severity, the lower the number.
SysComPortEnable	Enable/disable status of the serial communications port.

A.8.4 SmartTrunking MIB

Support for the Cabletron SmartTrunking MIB was added in firmware revision 2.01. Table A-5 describes the variables contained in the MIB.

Table A-5. SmartTrunking MIB Variables

Variable	Description
TrunkGlobalStatus	The global state of trunking capability for the switch, either True or False.
TrunkConfigTable	Trunk group configuration table indexed by TrunkIndex.
TrunkIndex	Trunk group number or index.
TrunkConfigName	The trunk group's name, used for informational purposes.
TrunkConfigProtocol	The trunking protocol in use, either no protocol or DEC Hunt Group.
TrunkConfigLoadBalance	The type of load balance algorithm applied to this trunk group (this variable is not applicable since the ELS100-24 trunking implementation does not support load balancing).
TrunkIfIndex	The index in the Interfaces MIB that is associated with the trunk group.
TrunkRowStatus	Variable used to create and delete trunk group interfaces in the TrunkConfigTable.
TrunkConnectionTable	Trunk group connection table indexed by ifIndex used to describe how local interfaces in a trunk group are connected to remote interfaces.
TrunkPortRemoteIfIndex	The ifIndex of the interface at the other end of this port in the trunk group link.
TrunkLLAPRequirement	Indicates whether this managed entity requires the LLAP protocol updates to perform the trunking function.
TrunkMaxTrunks	The maximum number of trunks that can be configured on the switch.
TrunkFlowDiagnosticTable	Table indexed by TrunkIndex and ifIndex which provides a means to programmatically evaluate the load balancing of a trunk group.
TrunkFlowDiagnosticInstalledFlows	A counter of the flows installed on this port since it was first operational.

The Power Up Diagnostics and Web Management Enable features in the user interface were available prior to Cabletron SmartSTACK ELS100-24 firmware revision 2.01, but were not documented in the Installation and User Guide. These features are documented in the following two sections.

A.9 Power Up Diagnostics

The Power Up Diagnostics feature allows you to enable or disable diagnostics software to be run every time the switch is initialized. The diagnostics software tests switch components to determine if the switch is fully operational before completing boot up.

1. Select System Configuration menu from the Main Menu of the user interface.
2. Select Power Up Diagnostics to toggle between enable (Yes) and disable (No).

A.10 Web Management Enable

The Web Management Enable feature allows you to enable or disable the capability to configure and manage the switch over the web.

1. Select System Configuration menu from the Main Menu of the user interface.
2. Select Web Management Enable to toggle between enable (Yes) and disable (No).